IMPERIAL AGRICULTURAL
15 NOV 1943
INSTITUTE

BERMUDA

REPORT

of the

DEPARTMENT

of

AGRICULTURE

for the year

1942

Report of Director of Agriculture, 1942.

I. AGRICULTURE IN 1942.

Active progress was made during the year in the programme to increase the local production of food and to build a sound agricultural industry. Each succeeding year of the war has seen less attention being given to the needs or possibilities of export markets, and more effort devoted to supplying the local market with a flow of produce throughout the year. Since production is seasonal this has involved investigation of systems of storage, so that produce grown during seasons of abundance can be carried through to periods when production is more difficult. Substantial advances were made along the two lines of production and of conservation.

For the first time during the course of the war the flow of imported supplies to the Colony was seriously interrupted and the need to be as self-reliant as possible in the matter of food was brought home to all thinking people. As a result there was created in the community a greater realization of the importance of farming and of food production.

Production: Although not uniformly successful, the year brought a greater measure of prosperity to the farms than many recent years. Farmers were very fortunate in the weather. There was a notable absence of high winds and the summer was remarkable for the frequency and regularity of its showers. These indeed were so frequent as to spoil the tomato crop but they greatly benefited other crops growing at the same time and resulted especially in an abundant supply of fodder which was badly needed at the time in view of shortage of imported feed for livestock. The total rainfall recorded at the Agricultural Station amounted to 63.45 inches and was considerably above the average for the previous ten years of 55.36 inches.

The farmer's greatest worry was the shortage of farm-labour, and this was a limiting factor in production on the farms. Indeed although production of food throughout the Colony has increased greatly during the war the increase in planting on the larger farms has been disappointingly small and a much greater increase is to be found in the gardens and small areas planted with little or no hired labour.

Another difficulty met by the farmer was the seed-supply and particularly the supply of seed potatoes, for which reliance is placed on the United States and Canada. Although no shortage of these supplies occurred, their delivery was seriously delayed in some cases. The bulk of the Bliss Triumph seed potatoes arrived a month later than the usual planting date, and while Leaf Roll, which undoubtedly occurred, was blamed for poor yield given by this crop, it is probable that the unseasonable planting had much to do with the poor results.

Another source of worry to the farmer was means of disposal of his crops. Owing to uncertainties of shipping few of the most perishable vegetables were grown with the idea of shipping abroad, but a very large crop of onions was grown to supply markets in North America and the West Indies. Unfortunately, just as this crop was ripening, the Colony was deprived of the means of shipment and owing to the wet summer the crop could not be held satisfactorily and wasted before shipment became possible. This disaster with onions stopped all attempts to ship vegetable produce abroad under wartime conditions, and left the grower with the single task of supplying the home-market to the best of his ability.

Planning of Production: The closure of the export trade to serve as an outlet for surplus vegetables and the necessity for growing as much food as possible at home have necessitated as never before that some central direction be given to the planting of the land. Under former conditions the farmer was left to plant these crops which he expected to sell most profitably. This however results in the crops which are expected to be most profitable being planted to excess while others are deficient. The planning of production to give an orderly and steady supply of vegetable crops was accordingly considered by a committee of the Board of Agriculture during the summer of 1942 and a useful report was written which was adopted by the Board as a basis for production plans. In this report an estimate of the monthly requirements of each of the staple vegetables needed to feed the community was submitted, and also a scale of prices which should be paid to the grower. The prices were not rigidly fixed but showed a range between a minimum price and a maximum price at which sales could be made, with the object of permitting some fluctuation in accordance with supply and demand and with quality of the produce. The Department's task was then to work out the acreage of land to be planted with the various vegetables each month to give the estimated consumption, and to encourage farmers to plant the required acreage of each vegetable. No guarantee of sale was to be made but it was presumed that if farmers followed the advice on planting and if yields were normal the production would be in line with consumption and there should be no large unusable surplus. The price-schedule was agreed to by the Wartime Supplies Commission, the Government authority responsible for fixing prices.

While it is early to discuss the success of the plan it appears to have worked well on the whole and to have fulfilled its main purposes of encouraging the farmer to produce and of stabilising the price of the main items of local produce. Certain faults have shown up, but none which cannot be remedied in another season. Consumption appears to have fallen below estimates and this may reflect the success of home-gardening efforts.

Encouragement of Production: Several new measures were adopted by the Government in order to increase production and consumption of local produce. For an experimental period of three months while fresh vegetables were plentiful, the sale of canned vegetables (most of which are imported) was prohibited and this ban proved highly successful in furthering the use of fresh local produce.

In order to assist the orderly marketing of potatoes the Department was authorised to buy potatoes from farmers as soon as they were dug and to store them for sale during the summer. As the yield was below average, the quantity bought was not large and the deal was carried out without loss to the Government. A similar purchase of onions was made, but owing to damp weather these could not be stored successfully and loss occurred.

The Government went a step further than it has previously gone in stimulating farming by making a cash payment to farmers who planted sweet potatoes within a given period of time. This was done towards the end of the planting-season when it was found that plantings were falling below the acreage desired. Although the scheme was not altogether satisfactory it resulted in an increase in planting of this crop which proved most valuable at a later date when Irish potatoes ran short.

Conservation: Production of vegetables is very much easier during the first six months of the year than during the next four months from July to October and, to provide a plentiful supply of produce for this period, means of conservation are essential. Conservation is rendered difficult by the high temperatures, sometimes combined with great humidity, during these months.

One of the notable achievements of the year was the opening of a Government Cold Storage Plant for the holding of vegetables. This had been urged by the Department of Agriculture for many years and after innumerable delays construction was finally started in 1941 and completed in May 1942, the plant being opened for use by His Excellency the Governor on 20th May. Built with the dual purpose of serving the local market and also a possible export market, the Chillrooms adjoin the Farmers' Market on Front Street and are on dockside property which was made available through co-operation of the Corporation of Hamilton. The plant was built for the Department of Agriculture by the Bermuda Trading Company, agents for the Frigidaire Corporation. It has six refrigerated rooms with a total storage capacity of 18,000 cubic feet and, though much smaller than the plant originally envisaged, it quickly proved its value. By its means a supply of fresh vegetables was preserved well into the summer months, and space was provided for part of the seed potatoes kept over the summer for planting in the autumn. The chief defect was its limited size, and proposals are being made for its extension.

Vegetables were also conserved by Canning, and the work of the Government Canning-plant is described in a later section. Tests were made of storage of vegetables, particularly potatoes and onions, in a store-room ventilated by forced air-draught, but up to the end of the year conclusive results had not been obtained.

The Easter Lily Trade: Lily-growers had a very successful year. A splendid crop was grown and shipment proved possible at the right time. There was a keen demand for the bulbs especially for the smaller sizes in the United States and Canada and prices were higher than for many years. The quantity of bulbs exported, amounting to 3774 cases, was the largest amount shipped from Bermuda in any year since 1931. Other bulbs which were exported, chiefly to Canada, included paper-white narcissus, freesias, Roman hyacinths, and amaryllis.

Livestock: Shortage of imported feed caused much concern to owners of livestock. The poultry business suffered particularly and great reductions were made in the flocks through the lack of grain to feed them. Horses also suffered, and many were taken from work and put out to grass while the feed was scarce. The raising of pigs on the other hand was successful owing to a good demand for fresh pork and to large supplies of swill suitable for pig-food being obtainable from military camps. So keen was the call for fresh pork that the stock of breeding sows was becoming

depleted and it was thought necessary to pass an ordinance prohibiting the slaughter of sows except under permit from the Government Veterinary Officer, such permit only being granted if it was considered that the sow could not profitably be used for breeding.

Dairying: In view of the intention of the General Board of Health to make compulsory the pasteurisation of all milk offered for sale, a survey of milk-production was made on 6th and 7th January to ensure that pasteurising facilities were adequate. This survey showed that there were only 661 milking cows in dairy herds. An almost equal number was privately owned, of which the milk did not come into the market. The quantity of milk produced for sale on the day of the survey was 4,403 U. S. quarts, and from dairymen's estimates it was calculated that maximum quantity offered for pasteurisation and sale would not exceed 6,000 U. S. quarts at any part of the year.

Pasteurisation was made compulsory as from the first of February, except in the two western parishes where no facilities were available, and producers were required to give up their retail business in order to sell wholesale to one of four pasteurising plants in the central and eastern districts. These plants were privately owned and three of the owners were themselves producers, a circumstance which proved disadvantageous to the scheme. The change-over to this system proved difficult, and unfortunately came at the beginning of a year which proved critical in other respects. Concentrated feed was unobtainable at times, supplies when they arrived were variable in quality and composition, and the milk-yield suffered severely. Shortage of labour added to the dairyman's difficulties. By the end of the year most dairymen who kept proper records found that they were actually losing money by keeping in business, and an urgent appeal for an increase in the controlled price of milk to the producer was under consideration.

One encouraging result of the shortage of imported feed was a much livelier interest on the part of dairymen in the growing of fodder crops. Land was broken up by many dairies and attention was given to the planting of fodder so far as farm-help was available. Much more remains to be done in the provision both of fresh fodder and of silage, which is hardly used at all at the present time.

General Outlook: In a previous report it was pointed out that one thing restricting both production and consumption of home-grown supplies was the fact that no great difficulty had been met in importing any foods that were desired. Some difficulty was experienced during 1942 and it added power as nothing else could have done to the Department's drive for more food and more fodder to be grown. It seems reasonable to assume that difficulties of supply will increase during the course of the war and after the conclusion of hostilities when starving millions in Europe and Asia will have to be fed. It is urgent therefore not only to maintain present production but to keep on increasing it. To make up for possible shortage of fresh fruit increased plantings of bananas and tomatoes are necessary, and to prevent the customary shortage of supplies in the warm months greater summer crops are needed. More sweet potatoes should be planted to supplement the supply of Irish potatoes, and much more fodder requires to be grown especially for the first three months of the year when grass is scarce. Finally, more cold storage space is needed to conserve and lengthen the life of perishable produce.

II. WORK OF THE DEPARTMENT.

The Department was fully occupied in directing and supervising the production, conservation, and marketing of food-crops and the time spent on experimental work had of necessity to be reduced.

Supervision of Production: During the summer a Farm-Register was prepared in which were recorded all plantings involving an acre or more of cultivated land. The Colony was then divided for purposes of supervision into four districts and a member of the Department was assigned to each. His duties were to keep records of the planting being done on the farms included in the Register, to advise the farmers as to future plantings, and to give whatever assistance he could in the control of diseases and pests, the lending or hiring of tools and equipment, and the marketing of the produce. From reports obtained from each district it was possible to make estimates of the supply of major vegetables immediately available from the farms, and forecasts of future supplies. This information was passed on to the Wartime Supplies Commission, the Government authority responsible for food-control, with whom close contact was maintained by the Department of Agriculture throughout the year. Officers engaged in crop-surveying and reporting were the Inspector of Produce, the Assistant-Inspector, and the Horticulturist, and their efforts were supplemented by those of Mr. James H. Hollis to whose energy and experience much of the success of this project was due.

A very effective form of assistance given by the Department was the providing of agricultural equipment for the use of farmers. As in previous years, farmers were able to hire spraying equipment which included a power-sprayer mounted on a motor-truck (kindly lent by the Public Works Department), two horse-drawn power-sprayers, and various types of hand-sprayers. To this was added a Cletrac tractor equipped with a two-furrow plough and disc-harrows, which was bought early in the summer. This machinery had been out of use for some time, but after being overhauled it was put at the service of farmers and was speedily in great demand. By the end of the year it had been employed in nearly every parish and there was a waiting-list for its use. In order to extend this type of service, additional equipment is being bought by the Department.

With tightening restrictions on the export of agricultural supplies from the United States it became necessary for the Department to assume responsibilities for acquiring essential needs. A purchase of fertiliser was made by Government to cover the needs of the Colony for a period, and certain types of seed and part of the seed potatoes were imported by the Department. In the case of the Bliss Triumph seed for autumn planting, Long Island was chosen as the source of supply for reasons of early shipment and Mr. E. A. McCallan, formerly Director of Agriculture, was asked to visit Long Island and inspect the fields and select the best for seed purposes. This opportunity is taken of expressing gratitude to him for the assistance so readily given, and also to Dr. F. E. Denny and Dr. S. E. A. McCallan of the Boyce Thompson Institute who gave very valuable help in the testing of samples for dormancy and presence of disease.

Assistance was also given to farmers in the growing and selection of their own seed potatoes. Bliss Triumph potatoes of Nebraska stock, grown in Bermuda during the spring and early summer and stored under refrigeration during the heat of the summer, gave very good seed for planting in September, proving more satisfactory in many respects than the seed

imported direct for the autumn crop. If more refrigerated space were to be had for this purpose, all the seed for the autumn crop of potatoes might well be home-grown.

Conservation and Marketing: Reference has already been made to the opening of the Government Chillrooms for storage of vegetables. This plant was in the charge of the Agricultural Assistant and it immediately proved its value to the farmer and to the community as a whole. By the end of May the space was filled with perishable vegetables such as cabbage, celery, lettuce and carrots and as the summer weather struck the vegetables in the fields it was possible to turn to the supply in storage. In this way the season for fresh winter vegetables was extended by several weeks. Although the produce placed in storage remained the property of the farmer, a large part of it was stored with instructions to the officer-in-charge that it was to be sold as opportunity offered, and the Agricultural Assistant was able to arrange sales to stores, hotels and other large users of vegetables. This service proved so useful to the farmer, that plans were made towards the end of the year to extend its scope and to form a Marketing Centre which would form an outlet to farmers who had produce to sell and a convenient point to which wholesale buyers could come for supplies. Every effort was made to interest the American Naval and Military forces stationed in Bermuda and the Base Contractors in the use of locally-grown vegetables, and several meetings were held with the Supply Officers to iron out difficulties of supply and price. Although the local growers were only able to supply part of the needs of the forces at the Defence Bases, nevertheless some useful sales were made.

The Government stepped in to assist the orderly marketing of two of the principal crops, potatoes and onions. The main potato crop is dug in April and May and sufficient potatoes should be grown to last through the summer. If a large crop is reaped however, many growers are faced with the discouraging fact that they are unable to sell their potatoes for several weeks after digging and, as few have good barns for storing, they are likely to lose much of their crop from wastage. In order to encourage the growing of a large crop, the Government offered to buy potatoes at the time of digging subject to their passing inspection, and arrangements were made to store these potatoes under the best conditions to be had, in order to reduce wastage so far as possible. This project was supervised by the Agricultural Assisttant and was carried through successfully. While the quantity offered to the Department was less than had been expected, the potatoes were stored without serious loss, and were sold during the summer at a price which covered the purchase and storage costs.

In the case of the large onion crop which was grown for export, it became evident as the shipping season started that the greatest difficulty was likely to be experienced in transporting the onions to markets overseas. By agreement between the Board of Agriculture and the licensed shippers of produce, a Marketing Pool was established and was run by the Department, the Agricultural Assistant being the responsible officer. All export sales were made by the Pool and all proceeds of sales were credited to the Pool. The purposes of this arrangement were to ensure that advantage was taken of all opportunities for shipment, and that all growers were given a fair chance of shipping. Growers were paid a uniform price from the Pool based on the average return per crate from all shipments made during the season. Under the conditions which prevailed, shipping was a disheartening process. No advance notice of sailing could be given, ships were

overloaded and badly stowed, and delays were interminable. One consignment, for instance, was four weeks on the way to Jamaica, a passage which normally takes five days. As a result, wastage in transit was heavy and reduced the returns, so that final payment to the growers was only at the rate of 4/2d per bushel crate. Efforts to store the balance of the crop for the use of the local market were largely unsuccessful owing to the wetness of the summer which rapidly led to sprouting and decay. Various methods of storage were tried, including storage under shelter in well-ventilated boxes and storage under refrigeration, but none proved able to stop the loss.

The Government Canning-plant had a most successful season, 4,556 cases being packed as against 2,233 in 1941, and 2,780 in 1940. To fill these cases, 79 tons of fresh vegetables were used of which the bulk consisted of carrots, beets, and white turnips, with smaller supplies of string beans. For the second year the tomato crop failed and no fruit was obtainable for canning. The Plant ran smoothly under the supervision of the Horticulturist and Mrs. Anna Lines. The daily output was significantly higher than in previous seasons but the actual cost of production was greater, since higher prices were paid for vegetables, empty cans, and fuel, and higher wages for labour. Nevertheless the cost compared favourably with that of imported supplies and the whole season's pack was sold within two or three days of its being released.

Extension Work: The production and use of home-grown food were encouraged by word and by demonstration. A splendid exhibit of vegetable produce was staged by the Agricultural Assistant and the Horticulturist at a Flower Show held in Victoria Park, Hamilton, on 22nd April which attracted very great interest. Another exhibit was arranged in co-operation with the Nutrition Committee of the Bermuda Women's Auxiliary Force on 13th and 14th November in the Farmers Market. In this exhibit, vegetables and fruits in season were displayed along with simple and appetising dishes made from them, and it was visited by a large number of people. Interest in the nutritional aspect of the food-supply was greatly stimulated by the visit of Dr. L. B. Pett, Director of Nutritional Services in the Canadian Ministry of Pensions and National Health, who came to Bermuda for a few days in October at the request of the Bermuda Government. In his public talks and in conversations with members of the Department Dr. Pett laid great stress on the nutritional value of fresh produce from farm and garden.

Talks on food production were given by members of the Department to various societies, amongst which the Food Prduction Committee of Warwick Parish deserves special mention for its active work. Eight issues of the Agricultural Bulletin were published for local distribution during the year and articles were written for the local Press informing the public what vegetables were plentiful and how they might be used.

Experimental Work: Plantings of a wide variety of crops were made at the Agricultural Station for purposes of observation. A variety of onion named Early Spanish gave promising results being almost as early as Yellow Bermuda and giving heavier bulbs. A high yield of fruit was obtained from two varieties of tomato, Valiant and Stokesdale, both obtained from Messrs. Francis C. Stokes Ltd, Vincentown, New Jersey, and planted during the winter.

Seventeen sweet potato varieties collected from plantings throughout Bermuda showed great differences in appearance and performance. The

trial was not replicated and critical results were not obtained, but yields varied from 17 lbs. up to 150 lbs. per row of 250 feet suggesting that by selection of a good variety the yield of sweet potatoes may be greatly improved.

Tests were made of fodders for growing in the summer months. Sudan grass gave excellent results, and Early Orange Sorghum, White Kaffir corn, Teosinte, Pearl Millet, and Desmodium, all grew well. Korean Lespedeza was tried during the winter months but made poor growth and would probably succeed better if sown in Spring. A trial of oat varieties, kindly supplied by the United States Department of Agriculture as resistant to rust, was started. A statistical field-trial on the manuring of potatoes was made by the Plant Pathologist. Assistance in the lay-out was kindly given by Mr. D. D. Paterson of the Imperial College of Tropical Agriculture. Owing to dry weather and shallowness of soil results obtained were inconclusive.

Plant Pathology: The Plant Pathologist reports that the wet weather favoured the spread of bacterial and fungal diseases. Two bacterial diseases recorded are leaf-spot of cabbage and broccoli caused by *Xanthomonas campestris* and a spotting of tomatoes due to *X. vesicatoria.* Blight of potatoes caused by *Phytophthora infestans* was prevalent but was kept under control by farmers most of whom profited by spraying-equipment hired out by the Department. A trial of the blight-resistant variety Sebago was made with good results. Late-planted potatoes rotted from attack by *Fusarium oxysporum,* and it is recommended that planting be completed by 15th February so as to permit digging before the end of May, and that a proper rotation of crops be observed. Leaf-roll was excessively high in Bliss Triumph seed potatoes imported from Long Island and these compared unfavourably with seed grown locally under supervision of the Department. Scab (*Actinomyces scabies*) caused severe attack on Bliss Triumph potatoes from seed grown in Nebraska, whereas Bliss Triumph seed from Nova Scotia, in some cases grown in the same field, was much less affected.

String Beans were attacked by Anthracnose (*Colletotrichum Lindemuthianum*) in one instance, and Yeast Spot or Stigmatomycosis of Lima and String Beans (possibly due to *Nematospora Coryli,* Pegl.) was noted as common following attack by the insect *Nezara viridula* in August. This disease has been present for some years in Bermuda though not hitherto recorded in the literature.

On Avocado fruits a symptom was seen which was thought to be "Thompson Spot", consisting of numerous corky areas encrusted with a white crystalline substance. This disturbance appeared to be non-parasitic and to be caused by unfavourable growing conditions. A new disease presumed to be Ficus Virus I was found on fig-plants imported from California. A species of *Poria* was seen associated with decay of a living sugar-apple tree *Annona sauamosa.* A die-back of English Walnut caused apparently by *Phytomonas Juglandis* was seen on a tree of variety Placentia, while the variety Eureka close by was not affected. These trees also were recently imported from California.

Continuing his work on disease of Bermuda Cedar the Plant Pathologist made the following new records: *Pestalotia coniqena* Lév. and *P. Micheneri* Guba (the latter previously recorded on *Araucaria excelsa*)

and *Stigmatea Juniperi* (Desm) Wint. found on living foliage. Year-old seedlings were found killed by the rust *Gymnosporangium bermudianum* (Farl.) Earle. *Pithya cupressi* (Batsch) Rehm isolated from cedar foliage was obtained in pure culture.

The Plant Pathologist in co-operation with Dr. F. J. Seaver continued work on the Mycoflora of Bermuda, the following new records being made:—

Pleurotus sapidus Kalch on rotten root of *Melia Azedarach* L.; *Ganoderma zonatum* Murrill on dead stems of *Sabal bermudana* Bailey; *Stereum australe* Lloyd on dead wood of *Myrica cerifera* L.: *Volvaria volvacea* Quél on decaying compost: and *Lepiota lutea* (With ex Secr.) Godfrin among grass under cedars. New host records were *Polyporus graminicola* Murrill on rotten roots and stumps of *Juniperus bermudiana* L., *Acalypha Wilkesiana* Muell, Arg., *Araucaria excelsa* R.Br., *Bambusa vulgaris* Schred., and on buried lumber; and *Cystopus candidus* (Pers) Lév. on *Brassica integrifolia* (West) Schulz., and *Sisymbrium officinale* Scop. Assistance given by the Director of the Imperial Mycological Institute, Prof. Guba, Prof. H. H. Whetzel, and Dr. J. A. Stevenson, Senior Mycologist, U. S. Department of Agriculture, is gratefully acknowledged.

Records of attack by insect pests include the destruction of vegetables by cutworms in the autumn months. Excellent results were reported by use of a poison-bait of bran 100 lbs., Paris Green 4 lbs., and lubricating oil (S. A. E. 20-30) 2 gallons. No new pests were recorded and, although quarantine measures were taken against entry of Japanese Beetle from the United States, no beetles were intercepted. The Mediterranean Fruit-fly, *Ceratitis capitata*, was seen laying eggs in the fruit of *Passiflora eduiis*, but the eggs failed to develop and damage was limited to small protuberances on the fruit. Attack by the tuber-moth, *Gnorimoschema operculella* on stored potatoes was less than usual and was unimportant. Reference is made to the increase in numbers of Whiteflies (Aleurodidae), following the spread of the fiddlewood tree *Citharexylum spinosum*, and the desirability of eradicating this tree which is itself becoming a pest. Severe damage caused by rats to many crops including sweet potatoes, pumpkins, melons, and cassava is reported and the need for an active and sustained campaign against rats is stressed.

The Plant Pathologist continued to give advice on mushroom growing and bee-keeping, both of which are being expanded.

Horticulture: The Horticulturist submitted a final report before taking appointment with the Department of Agriculture in British Guiana early in 1943. In this report he describes measures taken to expand the growing of fruit by the propagation and distribution of young plants. Many seedlings of papaw and of passion-fruit were distributed, and a number of grape-vines of American varieties were grown from cuttings. Loquats were sown for budding with improved varieties at a later date. Good results were obtained on a small scale in the propagation of citrus by cuttings which were inserted in damp sand in a glass frame in June, but it remains to be seen whether plants raised in this way will yield well.

Under wartime conditions the introduction of new plants was restricted but interesting plants under trial included the tree tomato *Cyphomandra betacea* of which seed was obtained from Malaya in Decem-

ber 1941, and *Hibiscus abelmoschus*, a species with attractive yellow flowers which was raised from seed obtained from Hong-Kong in April 1941. A white Bougainvillea from Trinidad flowered for the first time.

The ornamental grounds at the Agricultural Station were kept in good order throughout the year, and many useful and decorative plants were propagated. The Bernard Park continued to make good progress despite continual acts of destruction to plants and property. Notable improvements were made in the gardens at Government House which were under supervision of the Horticulturist. More land was broken up to make a new fruit-garden and to increase production of food and of fodder for livestock. An outstanding occasion was the planting of a tree of Bermuda Cedar by the Prime Minister, Mr. Winston Churchill, on 15th January during a short stay in Bermuda.

The Horticulturist addressed Arbor Societies and Garden Clubs on the growing of fruit and on other horticultural subjects and he continued to supervise the planting of school-gardens. This important work calls for much more time and attention than he could possibly spare from his other duties. It is one of the weaknesses of Agriculture in Bermuda that so few children grow up with any aptitude or liking for farm-work, and it is recommended that this work be no longer left to the Horticulturist but be done by a suitably trained instructor who will be able to devote his whole time and energies to the task.

Veterinary Work: Although livestock suffered at times from shortage of the types of feed to which they were accustomed, there were no serious epidemics of animal disease during the year. The cattle in all dairy-herds, and many owned privately, were tested for tuberculosis. In 1427 tests, 20 positive reactors were found and these were immediately slaughtered. In addition, two cattle slaughtered for beef were found to be tubercular.

Increased measures were taken against Bang's Disease and in particular the vaccination of calves between the ages of 4 and 8 months was made compulsory. Up to 31st December, 57 calves had been vaccinated successfully. All cattle subjected to the tuberculin test were tested at the same time for Bang's Disease, and the co-operation of the Bacteriologist at the King Edward VII Memorial Hospital in this work is gratefully acknowledged. Slaughter of cattle which proved to be heavily infected was recommended, and was carried out in the case of 32 animals. In general the tests indicated some improvement in the herds with respect to this disease. In this connection it is a pleasure to record the very kind assistance given by the United States Army Veterinary Corps and the Bureau of Animal Industry of the United States Department of Agriculture in supplying vaccines and antigen for the immunizing and testing of dairy cattle.

In order to control the use of horses during a period of extreme shortage of feed, His Excellency the Governor passed an Emergency Order under which horses could only be used by permit issued by a licensed veterinarian. The inspection of horses and issuance of permits under this Order fell largely on the Government Veterinary Officer who deserves credit for his sound handling of this extra duty. He was ably assisted by the S.P.C.A. Inspector, Mr. Carlyle Hollis. With the helpful co-operation of several owners of property, grazing was found for horses which lacked food.

The Department was also able to arrange the systematic collection of swill from the United States Army barracks and its distribution to several raisers of pigs.

Legislation: By Bye-law of the Board dated 20th May it was made obligatory on persons raising calves to have them vaccinated against brucellosis. By Order of the Governor under Emergency Powers Acts, the slaughter of cows, heifers, and sow-pigs was prohibited except by special permission of the Government Veterinary Officer. By another Order, the use of horses was prohibited except under permit issued by a licensed veterinarian and under such conditions as to type of work as were specified in the permit. Other legislation affecting Agriculture included Emergency Orders controlling wholesale and retail prices of vegetables, local meat, and eggs.

Acknowledgements: Grateful thanks are expressed to individuals and institutions, too many to mention by name, who sent publications, planting-material, and help of various kinds. Reference is due to Mr. G. R. Groves, who terminated his appointment of Horticulturist after five years spent with this Department. In this time he proved a valuable officer, willing to turn his hand to any task requiring to be done. It is a pleasure to record the loyal work of all members of the Department during a very strenuous year.

T. A. RUSSELL,

Director of Agriculture.

21st July, 1943.

Board of Agriculture, 1942.

From 1st. January to 14th May.

Sir S. S. Spurling, Kt., C.M.G., O.B.E., Chairman
Mr. J. E. Pearman, Deputy-Chairman
Wor. B. C. C. Outerbridge, J.P., M.C.P.
Mr. H. T. North, M.C.P.
Mr. J. E. P. Vesey, M.C.P.
Mr. A. C. Benevides
Mr. C. V. Zuill
Mr. C. M. Allen
Mr. J. H. Hollis

From 15th May to 31st. December.

Hon. W. J. H. Trott, C.B.E., M.C.P., Chairman
Mr. J. E. Pearman, Deputy-Chairman
Mr. H. T. North, M.C.P.
Wor. B. C. C. Outerbridge, J.P., M.C.P.
Mr. J. E. P. Vesey, M.C.P.
Mr. C V. Zuill
Mr. J. R. Outerbridge
Sir S. S. Spurling, Kt., C.M.G., O.B.E.

Department of Agriculture, 1942.

Director of Agriculture, T. A. Russell, B.Sc. A.R.C.S., A.I.C.T.A., Dip. Agr. (Cantab).
Plant Pathologist, J. M. Waterston, B.Sc. (Edin.) A.I.C.T.A.
Agricultural Assistant, W. R. Evans
Horticulturist, G. R. Groves
Inspector of Produce, T. Arthur Hollis
Clerk, Mrs. N. E. Pollendine (until 30th June)
Mrs. H. C. Carcaud (from 1st. July)

PART-TIME OFFICERS.

Government Veterinary Officer, C. J. Cooper, V.S.
Assistant Inspector of Produce, C. V. S. Early.